

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 12, 2003

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
J. J. McConnell, Deputy Technical Director  
**FROM:** R. T. Davis/ T. D. Burns  
**SUBJECT:** SRS Report for Week Ending December 12, 2003

Staff members R. Daniels, D. Gutowski, M. Moury, W. Yeniscavich and R. Zavadoski were on-site this week to support a series of four reviews. On Tuesday, Dr. W. Yeniscavich, Mr. R. Daniels, and Mr. D. Gutowski reviewed the site's integrated plans for deactivation and decommissioning of excess facilities. Also on Tuesday, Dr. R. Zavadoski and Mr. M. Moury reviewed site activities to replace in-service HEPA filters that have not been tested at the DOE Filter Test Facility. On Wednesday and Thursday, Dr. Yeniscavich, Mr. M. Moury, and Mr. D. Gutowski reviewed the status of open items from previous staff reviews of the Tritium Extraction Facility and assessed the site's construction oversight processes to ensure the Tritium Extraction Facility meets all specified design requirements. On Thursday, Mr. M. Moury reviewed the technical basis for recent functional classification downgrades for equipment in Glass Waste Storage Building #1 (site rep weekly 11/28/03) and the project status for Glass Waste Storage Building #2.

**HLW Activities:** Relatively high background radiation rates were measured at the service entrance for the 2F Evaporator during maintenance evolutions on personnel contamination monitors. The source of the elevated radiation rates was determined to be in the upper cell area near the blanked-off flange connection for the warming coil outlet (~2 R/hr at flange). The warming coils were isolated from service during implementation of the new DSA in January 2003 to address over-pressurization concerns. In response to the elevated radiation levels, the facility took appropriate action to shut down the evaporator and initiate cell inspections to determine the cause of the unexpected radiation source.

After completing the cell inspections and additional engineering assessments, WSRC has concluded that the stainless steel warming coils failed inside the evaporator pot allowing hot waste vapors to enter. Once inside, the waste vapors rose to the upper flange area where they subsequently condensed back to a liquid and became trapped in the nadir of a horizontal section of the coil outlet piping. Shielding in the upper cell area near the flange penetration was insufficient to accommodate the unexpected presence of waste in this section of the warming coil piping. Surveys by radiation control personnel indicate no waste escaped from the cell.

Compensatory measures have been put in place, including; increased shielding around the warming coil outlet flange, leak detection capability in the upper cell area, and increased radiation monitoring. After implementing the compensatory measures, the evaporator was restarted. WSRC is continuing to evaluate the cause of the warming coil failure and develop long-term options to address the potential exposure and contamination issues.